

# CODED-WIRE TAG RECOVERY

8201300

## SHORT DESCRIPTION:

Continue support for the coded wire tag (CWT) recovery program used to track progress in increasing run sizes for anadromous Columbia River salmonid populations, including stocks listed under the Endangered Species Act (ESA) and Pacific Salmon Treaty (PST) indicator stocks.

## SPONSOR/CONTRACTOR: PSMFC

Pacific States Marine Fisheries Commission  
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## SUB-CONTRACTORS:

Oregon Department of Fish and Wildlife  
(ODFW) Washington Department of Fish and Wildlife  
(WDFW) Regional Mark Processing Center (PSMFC)

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## GOALS

### GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Provides needed habitat protection, Adaptive management (research or M&E), Program coordination or planning

### ANADROMOUS FISH:

Research, M&E

### NPPC PROGRAM MEASURE:

84D.1

### RELATION TO MEASURE:

This is an on-going coded-wire tag recovery program that is used for stock identification of hatchery and wild anadromous salmonid stocks throughout the Columbia Basin. The tag recovery data is used to monitor the status of the various stocks, including those that are threatened and endangered. In addition, the recovery data are used to assess a wide variety of different studies.

### BIOLOGICAL OPINION ID:

NMFS BO - Basic Monitoring

### TARGET STOCK

Winter Steelhead  
Summer Steelhead  
Coho  
Fall Chinook  
Summer Chinook  
Spring Chinook

### LIFE STAGE

### MGMT CODE (see below)

S,A,P  
S,A,P  
S,A,P  
S,A,P,L  
S,A,P,L  
S,A,P,L

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## BACKGROUND

### Subbasin:

N/A: Basin-wide program

### Hydro project mitigated:

N/A This project is a basin-wide stock identification and monitoring program.

### Habitat types:

N/A This project is a basin-wide stock identification and monitoring program.

## **HISTORY:**

### **Coastwide CWT Program Overview:**

Coded-wire tags were first introduced in the late 1960's as an alternative to fin clipping and various types of external tags. Coastwide use quickly followed and led to the early establishment of large scale ocean sampling /recovery programs by the five State/Province fisheries agencies (ADFG, CDFO, WDFW, ODFW, CDFG). Tagging programs have continued to expand, with over 55 federal, state, tribal, and private agencies (including Canada) now releasing over 50 million CWT marked salmonids yearly. Approximately 1,600 new tag codes are released annually, representing hundreds of studies at a cost of over five million dollars. The marking cost per tag is approximately 10 cents. An additional \$9-10 million is expended coastwide annually in the recovery effort.

### **BPA's Funding Support of Regional Tag Recovery Programs:**

The Coded-Wire Tag Recovery Project has been funded by BPA since 1982. It is a coordinated effort by WDFW and ODFW to collect CWTs from mature salmon and steelhead which return to fishery (sport and commercial) and escapement areas (natural spawning grounds, hatcheries, and Bonneville Dam fishways). PSMFC's Regional Mark Processing Center (RMPC) provides user access to the regional CWT release, recovery and catch/sample information.

A coastwide CWT recovery effort is in place, with the burden of recovery costs resting primarily on the coastal states (Oregon, Washington, California, and Alaska) and British Columbia. However, beginning in 1982, BPA has funded its 'fair share' of the CWT recovery costs and distribution of CWT data because of the major component of BPA funded tagging in the Columbia River Basin. Approximately 30-35% of the total releases coastwide and 17-20% of the total tags recovered coastwide come from BPA funded programs.

The first year's funding in 1982 was \$400,000, with the funds administered through PSMFC. This support gradually increased until 1992 when BPA re-evaluated its 'fair share' and substantially increased funding for the Columbia River sampling program. At this point, BPA also began to fund a minor portion of PSMFC's Regional Mark Processing Center.

### **BPA Funding of the Regional Mark Processing Center:**

In 1992, BPA agreed to expand its 'fair share' funding to include support for 20% of the operations costs of PSMFC's Regional Mark Processing Center (RMPC) in accomplishing its role as a centralized coordination and data management center for all CWT data. The 20% level was selected because an estimated 20-25% of the 50 million tags released annually come from BPA funded projects in the Columbia Basin. Similarly, 17-20% of the coastwide tag recoveries come from BPA funded projects. Using this 20% guideline, \$54,000 of the RMPC's budget for FY1992 (\$274,252) was funded by BPA.

### **Needs for Increased Funding:**

Recent ocean fishing seasons have become more targeted by time and area to access regional healthy salmon stocks and minimize impacts on critical wild stocks. These ocean management and harvest strategies require higher 'pulses' of sampling effort to meet minimum sampling rates required by the current sampling design and BPA contract. To accomplish ocean fishery port sampling tasks, higher levels of sampling effort are needed to maintain the 20% rate resulting from more sporadic landing patterns. The introduction of mass marking of hatchery coho in coastal Oregon and much of Washington plus the Columbia River Basin, beginning with the 1995 brood year, will result in selective ocean and river fisheries commencing in 1998. This shift to mass marking and selective fisheries will significantly change CWT sampling methodologies and costs. Coded-wire tags in coho will be recovered in the various fisheries by electronic detection equipment rather than the traditional visual check for a missing adipose fin. This in turn will require major increases in sampling effort and costs to maintain present sampling rates.

## **BIOLOGICAL RESULTS ACHIEVED:**

A great variety of Columbia River fish studies are initiated with the use of the CWT. The majority of the tagging studies involve chinook and coho stocks, followed to a much lesser extent by steelhead stocks. Some tagging of sockeye stocks also occurs in the upper Columbia River. These studies include stock selection, disease and diet evaluation, rearing density evaluations, juvenile passage past dams, hydro-mitigation programs, fishery and escapement contributions, wild stock evaluations, and general life history parameters. The results of these studies would be very incomplete without recovery of the CWTs in the ocean and the Columbia Basin.

Biological results from ocean and Columbia River fisheries CWT data collection and analysis, in conjunction with escapement data, allow regional fishery managers to: 1) define distribution, contribution, exploitation rates, and survival rates for Columbia River stocks to set present and future management strategies; 2) Establish regional coordination and consistent evaluation standards to assess specific salmon stocks and their contribution to Oregon, West Coast, Canadian, and Southeast Alaska fisheries; and 3) Assess potential listing for regional stocks under the federal ESA.

## **PROJECT REPORTS AND PAPERS:**

All CWT recovery and related catch/sample information is provided to PSMFC's Regional Mark Processing Center where it is val

idated and then added to the existing coastwide CWT database. Information may be retrieved in the form of either standard reports or raw record sets via the on-line Regional Mark Information System (RMIS).•

Other related PSMFC publications include: Pacific Salmonid Coded-Wire Tag Releases (updated yearly); Mark List (updated yearly).

Quarterly and annual reports are submitted to BPA summarizing sample sizes, sample rates, areas sampled, and numbers of CWT recovered.

Direct management applications of this information are provided to the Pacific Fishery Management Council (PFMC) for inclusion in their annual Review of Ocean Salmon Fisheries and preseason salmon management reports (stock assessments and evaluation of annual fishery options). The CWT information is also instrumental in the assessment of critical regional salmonid stocks under the US/Canada Salmon Interception Treaty, and their monitoring of stock rebuilding through the Pacific Salmon Commission (PSC). Collected CWT information is reported by the PSC's technical committees in annual technical reports. Recent evaluations of Columbia River salmonid stocks for possible listing under the federal ESA are included in federal Stock Status reviews.

The CWT data also play a key role in a number of technical documents and internal agency reports that assist regional managers, scientists, and the public in the evaluation of contribution and distribution of salmon stocks reared in the Columbia Basin. These include technical reports produced by the U.S. vs Oregon Compact agencies for use in setting Columbia River sport and commercial salmon seasons. Other reports include: 1) the Status Report: Columbia River Fish and Fisheries; 2) The Lower Columbia River and Buoy 10 Recreational Fisheries; and 3) The Willamette River Spring Chinook Salmon Run, Fisheries, and Passage at Willamette Falls and 4) the Status Report: Oregon's Ocean Salmon fisheries.

#### **ADAPTIVE MANAGEMENT IMPLICATIONS:**

For more than 25 years, the collection and analysis of CWT recovery data from Columbia Basin and coastal hatchery stocks has provided a reliable and vital basis for forming present and future regional ocean and Columbia River fishery management strategies. The CWT information is used to stratify fishery and escapement salmonid populations by stock and age, and is used to reconstruct salmonid runs which are critical to building data sets used to predict abundance. These estimates of abundance (e.g., fall chinook) are used by coastal as well as inside fish managers to model various catch and escapement scenarios necessary to meet ESA impact restraints.

Loss or further reduction in BPA funding for CWT recovery activities in ocean fisheries and the Columbia River fisheries will jeopardize minimum sampling requirements of 20% sampling of landings and result in an inadequate CWT recovery and assessment to support stock management efforts. Lower CWT recovery rates for the Columbia River fisheries and Oregon ocean salmon fisheries, for example, may be inadequate, particularly for rare tag recoveries such as those pertinent of ESA listed stocks. Stock composition data for regional stocks could also become unreliable and thus increase the difficulty in determining the population status and stock composition of ESA listed and PSC indicator stocks. Reduction in BPA funding may also cause CWT recoveries to be inadequate for determining survival data necessary to evaluate BPA supported studies. Additionally, reduction in BPA funding would impact the timeliness of CWT extraction and decoding.

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## **PURPOSE AND METHODS**

#### **SPECIFIC MEASUREABLE OBJECTIVES:**

The results of a great variety of stock assessment studies will be achievable with CWT information provided by this program. It will also provide basic stock information used in run reconstruction and abundance forecasts of ESA listed as well as unlisted stocks. This enables fishery modeling to occur that minimizes impact on ESA listed stocks. Specific objectives are to continue random sampling of the fisheries at a minimum rate of 20%, and to transfer all collected snouts in a timely manner to either ODFW's Tag Processing Center at Clackamas or WDFW's Tag Recovery Lab in Olympia for tag extraction and decoding. The recovery data will then be forwarded on a timely basis to PSMFC's Regional Mark Processing Center for processing and then made available as quickly as possible to regional users via its Regional Mark Information System (RMIS).

#### **CRITICAL UNCERTAINTIES:**

Adequate and stable annual funding is a critical uncertainty for maintaining a quality CWT recovery program that is essential to achieve a wide variety of study results and wide ranging ESA related fisheries management capabilities. Included in a quality CWT recovery program is the need for rapid tag extraction and decoding for use in in-season management decisions. An additional complication is that the tagging and recovery phases of a CWT study are typically separated by two or more years, and thus funded under different fiscal cycles.

A second critical uncertainty is the introduction of mass marking of hatchery coho in Oregon and Washington (including the

Columbia River), and the start of ocean selective fisheries in 1998. Without increased funding support, many coastal ports of landing and Columbia River fisheries will not meet the minimum CWT sampling rate of 20% necessary for suitable CWT expansions for use in setting regional harvest strategies and assessing the impacts on critical ESA listed Columbia River stocks.

#### **BIOLOGICAL NEED:**

The recovery of CWTs from the ocean fisheries and the Columbia River is the single most vital element in the coastwide assessment of salmonid stocks and regional management strategies. Without this regionally gathered information, fishery managers would have little basis from which to assess Columbia River stocks, including those listed (or currently under review) under the federal ESA. Additional, the CWT information are used to calculate survival rates necessary to test hypotheses set forth in a wide variety of BPA funded studies.

#### **HYPOTHESIS TO BE TESTED:**

The Coded Wire Tag Recovery project is a basic data collection and monitoring program for a wide variety of studies releasing CWT marked fish in the Columbia River Basin. As such, this category (testable hypothesis) is more directly applicable to the respective studies.

However, the recovery data also provide suitable and non-biased data for evaluating the impact of the various fisheries on Columbia River hatchery and wild stocks. Specific questions that are addressed include:

- 1) Are mainstem Columbia River salmonid fisheries effectively targeting harvestable stocks without negatively impacting rebuilding efforts directed at weak and threatened stocks.
- 2) Are the Columbia River fisheries operating within the harvest constraints stated in the biological opinion produced by NMFS as part of the ESA.
- 3) Can regional PFMC and West Coast PSC salmon treaty fisheries be managed effectively for both regional hatchery and critical wild stocks based on CWTs collected in a stratified random pattern and at a minimum sampling rate of 20%.
- 4) Are West Coast/regional/Oregon ocean salmon fisheries operating within the guidelines and harvest constraints adopted by regional management strategies to protect and rebuild critical stocks mandated under the federal ESA.

#### **ALTERNATIVE APPROACHES:**

No cost affective alternative currently exists to assess critical Columbia River stocks in Columbia River and regional fisheries. The CWT has a long and successful history (over 25 years) as a fisheries stock assessment tool. One of its advantages is that adipose fin clipping and CWT application has little or no impact on fish survival as compared to other forms (e.g. fin clipping) of fish identification. CWTs are recovered by visual examination of returning adult fish for a missing adipose fin (chinook, coho, steelhead, sockeye and chum). or by electronic detection for coho starting in 1998.

The Pittag is an another exceptional tool for fish identification and is especially well suited for tracking of individual fish pass dams in rivers systems such as the upper Columbia River. However, it is not practical for use on a coastwide basis or even the entire Columbia River basin because of the significant cost per tag (circa \$3.00) relative to the CWT (~10 cents/tag). In addition, the Pittag is substantially larger and thus is not practical for marking smaller juvenile salmonids that are routinely marked in the snout cartilage with a CWT.

#### **JUSTIFICATION FOR PLANNING:**

The CWT programs focus on data collection within regional ocean and Columbia River fisheries to assess Columbia River salmonid stocks, with particular emphasis on those stocks which are threatened and endangered. The results of the CWT studies will also be used to add or modify facilities for fish, such as improvement in fish passage structures and rearing facilities.

#### **METHODS:**

Sampling of mature salmon and steelhead is conducted in fishery and escapement areas by examining carcasses for missing adipose fins (salmon) or missing ventral fins (steelhead) which serve as flags for CWT marked fish. Commercial and recreational fisheries are sampled at a minimum goal of 20%. Strict control is maintained so that sampling is random and representative of a population.

When a CWT marked fish is found, the snout is removed, labeled, and frozen for later decoding at ODFW's or WDFW's head laboratory. An individual recovery record is kept showing species, area and date sampled, sample size, and length. In some cases, additional information on weight, sex, and present of fin marks and other marks is also recorded.

Once the CWTs are decoded, the recovery data records are reported to PSMFC's Regional Mark Processing Center where the data are validated and then combined with coastwide recoveries reported by other agencies. Tag recovery data (summary reports and raw records) are then retrieved for research and harvest management analysis.

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## PLANNED ACTIVITIES

### SCHEDULE:

<b><u>Planning Phase</u></b>	<b><u>Start</u></b> 1982	<b><u>End</u></b> On-going	<b><u>Subcontractor</u></b> ODFW, WDFW 1992 On-going Regional Mark Processing Center
<b><u>Task</u></b> Columbia River commercial fisheries are sampled by WDFW and ODFW as they occur during the spring (February-May) and fall (August-November) fishing seasons, while the sport fisheries are sampled year round in response to increasing and decreasing effort in the fisheries. Oregon's ocean commercial troll fishery and recreational (charter and private vessel) fishery are sampled for CWTs at 12 major coastal ports of landing as required from May to November. Future sampling schedules will depend upon future fishing seasons. A proposal under consideration by the Pacific Fishery Management Council for 1997 ocean fisheries off Oregon, would change the opening date for ocean fisheries from May 1 back to April 15, thus increasing the need to sample added time periods. The recent major regional (Washington, Oregon, California) change in management strategy to use the adipose only clip (no CWT) to mass mark the 1995 brood hatchery coho for most of SW Washington, Columbia River, and coastal Oregon will profoundly change Oregon's ocean			
<b><u>O&amp;M Phase</u></b>	<b><u>Start</u></b> 1982	<b><u>End</u></b> On-going	<b><u>Subcontractor</u></b> ODFW, WDFW 1992 On-going Regional Mark Processing Center
<b><u>Task</u></b> On-going CWT recovery programs in the Columbia Basin and Oregon ocean fisheries; Data management by PSMFC's Regional Mark Processing Center			

### PROJECT COMPLETION DATE:

On-going CWT data collection and processing

### CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:

Without adequate CWT sampling rates, the analysis of Columbia Basin stock impacts cannot be correctly evaluated. This can result in faulty or incorrect conclusions that can then negatively impact management policy on ocean harvest (PSC/PFMC regulations) and Columbia River harvest, U.S. vs Oregon, ESA evaluations, and PSC area treaty fisheries.

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## OUTCOMES, MONITORING AND EVALUATION

### SUMMARY OF EXPECTED OUTCOMES

#### Expected performance of target population or quality change in land area affected:

Biological Objectives: CWT recovery information will provide the results of a wide variety of fish studies funded by BPA throughout the Columbia Basin that have the general purpose of increasing survival.

Management Objectives: CWT recovery information will provide the basis to monitor and assess the impacts of the ocean and Columbia River fisheries on Columbia Basin salmonid stocks, including those considered or already listed under the federal ESA. This assessment includes stock distribution, fishery contribution, survival, and exploitation rates by fishery time and area.

#### Present utilization and conservation potential of target population or area:

Columbia River salmonid stocks, principally chinook and coho, are harvested by commercial troll and recreational ocean fisheries as well as sport and commercial fisheries in the mainstem Columbia River and sport fisheries in Columbia River tributaries. The CWT data collection program is critical in providing necessary information to manage these stocks in regional ocean fisheries and in-river fisheries. Collected and assessed CWT information allows for current effective fishery utilization and/or harvest impacts of Columbia River salmonid stocks at an appropriate level that allows for critical or ESA listed Columbia River stocks to be maintained or rebuild.

#### Assumed historic status of utilization and conservation potential:

Historically, Columbia Basin salmonid runs were harvested in extensive sport and commercial fisheries through the early 1900's.

Limitations of fisheries began in the 1940's as Columbia Basin salmonid populations declined. During the 1970's and 1980's fisheries management greatly increased restrictions on fisheries to aid in conservation of depressed stocks. In the 1990's, the federal ESA was applied to selected Columbia River salmonid runs and has greatly limited Columbia River fisheries. Columbia River chinook stocks, particularly lower River fall (Tule) chinook, have historically been a significant portion of the regional and Oregon ocean catch in troll and recreational fisheries. Recent declines in brood survivals in the 1990's have drastically reduced their composition in fisheries and has necessitated severe restrictions in some ocean fisheries off Oregon and Washington. Columbia River coho stocks, mostly of hatchery origin but with some wild components, have historically been the predominant specie targeted in Oregon's ocean fisheries as hatchery production increased in the early 1960's and high ocean survivals continued through the mid 1970's. Since the early 1980's, these stocks have increasingly been managed under quotas established by the PFMC, as ocean coho survival has decreased and other ESA listed Columbia River stocks and Oregon coastal wild coho stocks have been managed under stricter guidelines for rebuilding and adult escapement goals.

**Long term expected utilization and conservation potential for target population or habitat:**

The continuation of present CWT recovery and monitoring programs in regional ocean and Columbia River fisheries will provide the biological and technical basis to help meet future conservation goals for rebuilding Columbia river salmon stocks and provide potential increased access and opportunity by fishers to harvest of Columbia River stocks.

**Contribution toward long-term goal:**

Monitoring data for anadromous fish populations in the Columbia Basin will provide information concerning stock status of Columbia Basin salmonids and stock compositions in Columbia Basin sport and commercial fisheries. Data collected by this project is critical to determining the status of Columbia Basin salmonid stocks.

**Indirect biological or environmental changes:**

Results of Columbia River fish studies initiated with the use of the CWT may produce results that will improve survival rates of hatchery and wild Columbia River juvenile and adult salmonids.

**Physical products:**

An estimated 34,000 CWTs will be recovered by the ODFW head lab from fish sampled by ODFW and WDFW in the various ocean and in-river fisheries (commercial and sport). The data will be made available for use by researchers, managers, and citizens via the Regional Mark Processing Center's on-line CWT database.

**Environmental attributes affected by the project:**

Stock status and fishery specific stock compositions can be determined using data collected by the BPA funded CWT recovery program. These data provide managers with information necessary to aid in reducing harvest of depressed stocks. Stock status, as determined by CWT recovery analysis, may affect future ESA listings and therefore determine stream flow and land use regulations.

**Changes assumed or expected for affected environmental attributes:**

Future changes in regional and in-river salmon harvest and fishery management strategies are determined, in part, by the increase or decrease in population status of Columbia River salmonid stocks. Changes in stock status may also effect environmental regulations.

**Measure of attribute changes:**

N/A. The CWT program is a data collection and monitoring activity.

**Assessment of effects on project outcomes of critical uncertainty:**

The effects of critical biological uncertainties on the CWT collected data from regional ocean and Columbia River fisheries will be assessed through mathematical assessment modeling. Uncertainties in funding support will be evaluated as they occur and the CWT recovery project plan amended to respond to these changes. It is expected that regional (Oregon and Washington) mass marking of 1995 brood hatchery coho stocks for potential 1998 fisheries will necessitate changes in CWT sampling protocol and require added fundings upport to maintain the 20% minimum sampling rate.

### Information products:

In addition to providing a database of CWT recoveries, an important corollary product is detailed catch statistics for Columbia River and ocean fisheries. Catch statistics are essential for management of ESA listed and PST indicator stocks.

The Oregon ocean CWT data collection project provides technical stock status and composition information on critical Columbia River, ESA-listed stocks each year for regional fishery managers and decision-makers. These information products are summarized in the PFMC postseason Review of Fisheries and preseason technical documents that describe status and potential fishery harvest options. Other information products include ocean fishery CWT data summaries to regional fishery stock assessment modeling efforts and other technical and annual contract reports as needed.

### Coordination outcomes:

Regional Mark Information System (RMIS): The Mark Center completed an extensive development and data migration project to establish the CWT data on a relational database (Ingres) running on a Sun platform. RMIS provides on-line access to all coastwide CWT data, including that for the Columbia Basin tagging studies. Data sets include: 1) Release; 2) Recoveries; 3) Catch/Sample; and 4) Location codes. The Mark Center also serves as the U.S. site for exchanging U.S. coded wire tag data with Canada for Pacific Salmon Treaty purposes. Users may obtain a variety of release and recovery reports, as well as data records in either raw or aggregated form.

Some of the features of RMIS include:

- a) Ability to automatically build lists of tag codes from the release data, edit the lists, and then use them to retrieve coastwide tag recoveries.
- b) Ability to select hatcheries and recovery sites by geographic location name rather than the code.
- c) Improved file transfer speeds.
- d) Data transfer options via telenet, FTP, or the Internet).
- e) User generated report formats.
- f) Access to catch/sample data, and some non-CWT release data.

Further RMIS enhancements are underway. These include improved file compression to improve file transfers, data selection by geographic regions and basins, and improved system help documentation. In addition, development is underway to improve sharing of software tools, user applications, and data with other regional data management projects, including the PIT tag database and StreamNet.

The Mark Center is actively developing a WWW site for access to PSMFC's CWT database via the RMIS system. Planned developments include CWT query and reporting (HTML-forms based), current data status tables with links to the Data Description file, and CWT query and reporting based on maps. To date, the system offers a variety of ways to select subsets of CWT data via queries, build reports from those queries, and electronically transfer the reports. Types of data currently include tagged releases and recoveries.

Key access information to PSMFC's computer and RMIS is provided below:

Telnet: [telnet.psmfc.org](telnet:psmfc.org)

FTP: <ftp.psmfc.org>

WWW: <http://www.psmfc.org>

dial-up: a) (503) 650-5437 (up to 28,800 bps)

b) (503) 650-5437 (up to 28,800 bps)

A World Wide Web based discussion forum has also been developed to facilitate the work of the PSC Data Sharing Committee and the PSC Working Groups on Data Standards and Catch Exchange. The forum allows the posting of new agenda items for a given meeting as well as on-going discussion and recommendations about previously posted items. It will be expanded for use by other entities such as the Regional Mark Committee and For the Sake of the Salmon.

### MONITORING APPROACH

Sampling of mature salmon and steelhead is conducted in fishery and escapement areas by examining carcasses for missing adipose fins (salmon) or missing ventral fins (steelhead) which serve as flags for CWT marked fish. Commercial and recreational fisheries are sampled at a minimum rate of 20%. Strict control is maintained so that sampling is random and representative of a population.

When a CWT marked fish is found, the snout is removed, labeled, and frozen for later decoding at ODFW's or WDFW's head laboratory. An individual recovery record is kept showing species, area and date sampled, sample size, and length. In some cases, additional information on weight, sex, and present of fin marks and other marks is also recorded.

Once the tags are decoded, the recovery data are loaded into the PSMFC CWT recovery database where it is validated and then combined with coastwide recoveries reported by other agencies. Tag recovery data (summary reports and raw records) can then

be retrieved for research and harvest management analysis.

#### **Provisions to monitor population status or habitat quality:**

Columbia River chinook, coho, and steelhead stocks are all currently being evaluated for listing under the ESA. Presently, Snake River chinook (spring, summer, and fall) and sockeye are listed under the ESA. Additionally, US v. Oregon's Columbia River Fish Management Plan sets forth guidelines for harvest and escapement goals for Columbia River salmonids. State fishery management plans produce additional guidance to fish managers concerning harvest of Columbia River salmonids in tributary fisheries. State stock status reports such as Washington's 'Salmon and Steelhead Stock Status Inventory' further monitor regional stock status. Regional Ocean and Columbia River fisheries are adopted via PFMF, PST, and/or the states and are evaluated relative to ESA listed stock impacts.

Staff from the Oregon ocean CWT sampling project directly monitor existing sampling programs to ensure that sampling protocol and design objectives are followed. Collected data are combined with data from Washington ocean and Columbia River fisheries through PSMFC so that critical Columbia River stocks can be assessed relative to expected impacts in fisheries and evaluated as to their respective rebuilding.

#### **Data analysis and evaluation:**

CWT recovery data will be analyzed by both ODFW and WDFW's Ocean Salmon Management Programs, the Columbia Basin Tribes (including those represented by CRITFC), IDFG, PFMC, PSMFC, and the Pacific Salmon Commission to determine stock composition in Columbia River sport and commercial fisheries and harvest of Columbia River salmonids in ocean fisheries. These data will also be used to determine stock specific exploitation rates. Harvest data will be combined with escapement data to produce annual population estimates for Columbia River salmonid stocks.

#### **Information feed back to management decisions:**

Collected CWT data is made available through the PSMFC Regional Mark Processing Center to PFMC, PSC, Columbia Basin Tribes and States for analysis and management decisions. Based on fishery stock compositions, managers can determine if stock specific harvest rates exceeded preseason expectations or guidelines set forth by the ESA or Columbia River Fish Management Plan. Additionally, these data allow annual updates on the status of Columbia River salmonid stocks.

#### **Critical uncertainties affecting project's outcomes:**

Funding changes or mass marking could reduce the CWT sampling rate to below the 20% goal leading to a loss in precision of stock specific harvest estimates, which may result in overharvest of a critically depressed stock. Additionally, escapement, ocean harvest, and tributary sport harvest data must be maintained at its current level to continue evaluation of the status of Columbia River salmonids.

The ODFW ocean sampling project for CWT collection requires minimal levels of 20% sampling rate of the landing catch in order to support valid statistical expansions of the collected data. A critical uncertainty is caused by potential lack of adequate funding by the multiple funding sources that support this activity. Sample data analyzed from below minimum sampling rates causes wider variability and less precision in evaluating harvest impacts assessment of escapement/rebuilding goals for target stocks. The development of regional hatchery coho mass marking beginning with the 1995 brood will affect our sampling plan and CWT recovery ability in ocean fisheries. Ocean harvest managers have a research need to evaluate the impacts, encounter rates, and resulting mortality rates for wild/hatchery components in at-sea sampling observations to assess the effectiveness of such ocean and terminal area "selective fisheries."

### **EVALUATION**

The ocean and Columbia River sport and commercial fisheries CWT collection project is designed to maintain a minimum of 20% sampling rate of landed salmon catch. One criteria for success is based on meeting this rate for each time/area "cell" where sampling takes place. Another is the timely handling and transfer of collected salmon snouts for processing at the ODFW Fish Identification Lab at Clackamas to meet reporting deadlines for PSMFC's Regional Mark Processing Center.

On a larger scale, regional stock status reports may be used to judge the project's efforts towards rebuilding depressed stocks.

#### **Incorporating new information regarding uncertainties:**

Fisheries will be prioritized based on stocks harvested and ability to sample. Sampling efforts will be reviewed and allocated based on this prioritization. Changes in stock status or ability to sample specific fisheries will be reflected in this prioritization.



### **Increasing public awareness of F&W activities:**

In order to achieve a 20% sample rate for sport fisheries, many individual anglers must be contacted. Up to 50,000 anglers are interviewed annually on the Columbia River alone. This provides a unique opportunity to educate and interact with citizens in a one on one situation. Additionally, data collected by this project are used in a variety of management reports that are used in a variety of public forums. These reports are also regularly mailed out to interested fish managers, fishers, and the general public. Summarized data from this project is commonly used in public meetings where fishery management decisions are made (i.e. compact hearings).

The ocean CWT sampling project distributes CWT information to all salmon fishers on request and publishes expanded inseason and postseason summaries for public and user groups use, as needed. In 1996, the ocean CWT recovery project contacted 1,800 ocean commercial troll trips and 38,500 ocean recreational angler trips giving field staff the opportunity to education salmon fishers about the program, regional efforts to manage critical stocks, and discuss the importance of CWT programs. Collected CWT data provides a benchmark for the salmon industry and regional decision-makers to assess the results of certain fishery strategies and resulting increases or decreases in meeting escapement goals. It directly promotes public awareness of managers efforts to protect critical or ESA listed salmon stocks from the Columbia River and provides them rationales for strategies applied to enhance and rebuild such stocks.

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## **RELATIONSHIPS**

### **RELATED BPA PROJECT**

### **RELATIONSHIP**

Oregon and Washington's ocean CWT recovery programs are aided by varying levels of support, including the federal Anadromous Fish Act, U.S. Dept. of Interior Sport Fish Restoration, and Pacific Salmon Treaty (PST) funding. The commercial sampling program in the Columbia River and sport sampling programs in the Columbia River and Willamette River are also supported by funding from the Wallup/Breaux Act, PST, and states of Washington and Oregon. These additional funding sources make it possible to attain adequate sampling rates for recovery of CWT's, and to summarize data that is critical to determine the status of Columbia River salmonid populations. Funding for Columbia Basin fish counting facilities, which are essential to determining the status of Columbia River salmonid stocks, also comes from a variety of sources, including governmental and private agencies.

### **OPPORTUNITIES FOR COOPERATION:**

The BPA contract for the collection of CWT information in Oregon's ocean fisheries and in the mainstem Columbia River fisheries (cooperatively sampled by ODFW and WDFW) provides a major portion of the necessary funding to complete this program annually. However, additional funding support is required to achieve the necessary sampling rates and coverage of the fisheries. These funds come from several sources, including Anadromous Fish Act (AFA), Pacific Salmon Treaty, federal Sport Fish Restoration (Wallup/Breaux), and the states of Oregon and Washington. Multiple funding entities and some joint state agreements (e.g.: AFA funding provides the basis for regional cooperation in setting standards for CWT collection procedures and efficiency).

Data recovered in this program is incorporated into PSMFC's regional CWT database and distributed to a variety of federal, state, industry, private, international, and public users.

All Columbia River fisheries must be addressed in the ESA process involving the Technical Advisory Committee (TAC) of the Columbia River Fish Management Plan as author of the Biological Assessment concerning fishery impacts. Final approval of fisheries and harvest are then the responsibility of the NMFS.

Regional ocean harvest strategies are adopted via the PFMC, PST, and the States. Additionally, all proposed ocean fisheries are evaluated relative to ESA listed stock impacts. The current CWT collection and evaluation system is the basis of this assessment prior to implementing harvest regulations. Without this CWT information, regional ocean fisheries and many Columbia River fisheries would be curtailed or eliminated due to lack of appropriate stock harvest information

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## COSTS AND FTE

**1997 Planned:** \$1,400,759

### FUTURE FUNDING NEEDS:

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$1,688,703		100%	
1999	\$1,770,638		100%	
2000	\$1,856,670		100%	
2001	\$1,947,004		100%	
2002	\$2,067,718		100%	

### PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>OBLIGATED</u>
1982	\$245,000
1983	\$549,100
1984	\$546,000
1985	\$579,814
1986	\$598,634
1987	\$1,200,000
1988	\$270,478
1989	\$813,251
1990	\$738,663
1991	\$872,452
1992	\$1,324,279
1993	\$1,285,319
1994	\$1,329,363
1995	\$1,241,271
1996	\$1,251,738
1997	\$1,400,759

TOTAL: \$14,246,121

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

### LONGER TERM COSTS:

This project is expected to extend beyond the year 2002. Costs should rise to keep pace with increases in the cost of living. Costs may need to increase above the cost of living if the ESA increases the need to either sample more fisheries or sample fisheries at a higher level.

Additional increases, indeterminate at this point, also may be required before the year 2002 to cope with the possible expansion of mass marking to include Chinook hatchery stocks and corresponding increased sampling costs for CWTs.

Continued operations and maintenance.

**1997 OVERHEAD PERCENT:** ODFW 20.5%, WDFW 19.5%, PSMFC 15%

### HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

Portion of direct costs (does not include equipment)

### CONTRACTOR FTE:

ODFW: 4 full time and 135 man-months of temporaries WDFW: 8 full time or career seasonals, and up to 8 temporaries (PSMFC staff)RMPC: None

**SUBCONTRACTOR FTE:** ODFW:0 WDFW: 1 part-time biologist (6 months), 1 secretarial support (2 months)

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